

## Gamma knife stereotactic radiosurgery for brain metastases

This leaflet is for people who are considering gamma knife radiosurgery for brain metastases. It explains the procedure, its advantages and risks, and aims to answer the main questions you're likely to have. There is a separate general guide to gamma knife radiosurgery which explains the procedure in more detail. For a copy of this, or if you have any additional questions, please speak to your doctor or another member of the gamma knife team.

### What is a brain metastasis?

Brain metastasis is a cancer that has spread to the brain from another site in the body. It mostly commonly spreads from the breast and lung but can come from other areas.

### What is gamma knife surgery?

Gamma knife radiosurgery uses a beam of radiation to treat conditions affecting the brain, head and neck. It does not use a knife, it is a non-invasive treatment that does not need any skin incision.

### The benefits of gamma knife radiosurgery

The accuracy of the gamma knife radiosurgery system enables a high dose of radiation to be focused on a very precise area. This means one treatment is generally all that is needed.

One of the major benefits of gamma knife radiosurgery is that it is non-invasive. Other benefits include the following:

- There is no incision. This means you won't need to shave your head and you'll have no scars to heal. It also avoids the risks that can be associated with open surgery, such as bleeding and infection.
- You're unlikely to have hair loss or nausea.
- The procedure is relatively painless and in most cases a general anaesthetic isn't needed.
- We find that most people get back to their normal activities in a day or two (compared to two to six weeks recovery time with conventional brain surgery).

Gamma knife radiosurgery usually has minimum complications. Indirect comparisons suggest it produces fewer complications than other treatment techniques.

### What are the alternatives to gamma knife radiosurgery?

The alternative treatments for brain metastases are open surgery or whole brain radiotherapy. Other radiosurgical alternatives such as Linac based treatment forms, Cyber Knife or Proton beam based treatments may also be used.

The decision as to which is the correct procedure for you will depend on the size and location of your metastases. Your doctor will discuss all the options with you.

## **About the gamma knife procedure**

There are several steps to the procedure but these will all be done in one day. Generally you will be admitted to the hospital the night before or on the morning of your gamma knife radiosurgery. You will be asked not to eat or drink anything for four hours before your procedure (unless you have diabetes). You will also be asked to wash your hair. You may be given medicine to help you to relax.

Before the surgery can take place, you'll have a lightweight head frame fitted. This is used to pinpoint the area to be treated by the gamma knife. A local anaesthetic will be injected in four places into your scalp where the frame will be fixed with screws. These injections may be painful but will only last for a few seconds. The frame will stay attached to your head for the whole procedure.

To find the exact position of the area that needs to be treated, you will need to have a magnetic resonance imaging (MRI) scan. A neuro-radiologist (a doctor who specialises in using imaging methods on the brain), physicist and your doctor will plan the optimal dose of radiation and the most precise way of targeting it to the relevant area.

You will return to the gamma knife unit where you'll be carefully positioned on the couch so that your head remains completely still. The gamma knife procedure may involve one or several exposures to the radiation. The time this takes will depend on the size and locations of your metastases. You will be able to talk to our staff through a microphone in the gamma knife machine throughout the procedure.

## **Recovering from gamma knife radiosurgery**

Once the procedure is finished, you will have the head frame removed and you can go back to rest in your room. When the frame is taken off you may have slight bleeding from the points where it was held in place. You may also feel sick or have a headache but this shouldn't last for more than a few hours. Most people stay overnight in the hospital after gamma knife radiosurgery. Depending on your general health, you should be able to get back to your normal activities the day after treatment.

## **Follow-up**

The aim of gamma knife treatment for metastases is to stop tumour growth. The tumours will usually shrink three to six months after the gamma knife surgery. The majority of tumours which are less than 2cm do not need any further gamma knife surgery.

Your doctor will give you details but it is usual to have a follow-up appointment every three months. These appointments will include an MRI scan.

## **What are the risks?**

As with every procedure, there are some risks associated with gamma knife surgery. In order to make an informed decision and give your consent, you need to be aware of the possible side effects of this procedure.

The specific side effects are dependent on the location of the metastases in the brain. Your consultant will discuss all these with you.

If the tumour is large or requires a high dose of radiation, you may be given steroids to reduce any swelling around it and reduce pressure in the surrounding areas.

Your doctor will talk to you about the potential risks and side effects of gamma knife radiosurgery for your individual circumstances. If your doctor recommends that your metastasis is treated with the gamma knife, this will be based on the judgement that it carries lower risks than conventional surgery.

## Contact

If you have any questions or need further information, please contact your doctor, or the gamma knife centre Monday to Friday, between 9.00am and 5.30pm.

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## Further information

Macmillan provides information and support for patients.

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